



west virginia department of environmental protection

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Randy C. Huffman, Cabinet Secretary
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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2818C
Plant ID No.: 051-00125
Applicant: MarkWest Liberty Midstream & Resources LLC (MarkWest)
Facility Name: Majorsville Gas Plant
Location: Majorsville, Marshall County
SIC Code: 1311
NAICS Code: 211111
Application Type: Modification
Received Date: October 21, 2010
Engineer Assigned: Jerry Williams II, P.E.
Fee Amount: \$1,000.00
Date Received: October 21, 2010
Complete Date: November 18, 2010
Due Date: February 16, 2011
Applicant Ad Date: October 22, 2010
Newspaper: *The Wheeling Intelligencer*
UTM's: Easting: 540.95 km Northing: 4,423.83 km Zone: 17
Description: Modification permit application to install a new tower and components for an additional 140 mmscf/day processing facility, one (1) new compressor engine, and one (1) new process heater.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2818C:

MarkWest proposes to modify the natural gas processing plant at the Majorsville site by adding an 140 mmscf/day processing facility, one (1) 4,735 hp Caterpillar G3616 compressor engine, and one (1) 7.62 mmBTU/hr process heater.

The Majorsville Processing Plant is used as a gathering station for gas wells throughout southwest Pennsylvania and West Virginia. Upon entering the plant the gas will go through a mol sieve which is designed to remove liquids from the gas stream through contact. Heaters will be employed to heat and regenerate the mol sieve on a regular basis to remove the water and the

hydrocarbons. After the mol sieve the gas will be cooled through a cryogenic plant with mechanical refrigeration which serves to remove propane and heavier hydrocarbons in the gas stream. At this point the gas is ready for compression and will pass through one of the gas-fired compression engines prior to entering the downstream pipeline to a distribution or processing company. Electric pumps will be located on the site to transfer the removed saltwater and hydrocarbons to another site for further processing.

SITE INSPECTION

On December 8, 2009, the writer spoke with Al Carducci of the DAQ NPRO and he stated that he did not see a problem with locating a natural gas processing plant at this site.

Directions as given in the permit application are as follows:

Near town of Majorsville on Calis Majorsville Road (CO. Hwy. 15) and Majorsville Road.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this permit will consist of one (1) natural gas fired compressor engine, one (1) natural gas fired heater, and fugitive emissions. The estimated emission calculations were performed by MarkWest and checked for accuracy and completeness by the writer. The following tables include the emission source, and controlled emission rate:

Emission Point ID#	Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
8E C-2102	4,735HP Caterpillar G3616LE Compressor Engine	Nitrogen Oxides	5.22	22.87
		Carbon Monoxide	1.44	6.29
		Particulate Matter-10	0.01	0.01
		Sulfur Dioxide	0.01	0.01
		Volatile Organic Compounds	1.64	7.20
		Formaldehyde	0.42	1.83
9E H-2741	7.62 MMBtu/hr Heatec Process Heater	Nitrogen Oxides	0.62	2.72
		Carbon Monoxide	0.52	2.28
		Particulate Matter-10	0.05	0.21
		Sulfur Dioxide	0.01	0.01
		Volatile Organic Compounds	0.03	0.15

7E	Fugitive Emissions	Volatile Organic Compounds	NA	7.38
FUG-001	(Connections/Valves)	Total HAPs	NA	0.72

The following table indicates the control device efficiencies that are being utilized:

Emission Point ID	Control Device	Emission Unit	Pollutant	Control Efficiency
C-2102	NSCR	Caterpillar G3616 Compressor Engine	Carbon Monoxide	95%
			Volatile Organic Compounds	75%
			Formaldehyde	90%

The emission changes associated with this application are shown in the following table:

Pollutant	Annual Emissions Before R13-2818C (tons/year)	Annual Emissions After R13-2818C (tons/year)	Emissions Change (tons/year)
Nitrogen Oxides	68.81	94.40	25.59
Carbon Monoxide	25.47	34.04	8.57
Volatile Organic Compounds	29.49	40.53	11.04
Particulate Matter-10	0.32	0.53	0.21
Sulfur Dioxide	0.06	0.07	0.01
Formaldehyde	6.65	8.48	1.83

REGULATORY APPLICABILITY

The following rules apply to the facility:

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that MarkWest exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also

subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR60 Subpart JJJJ and 40 CFR60 Subpart KKK).

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60, Subpart KKK, and 40CFR60, Subpart JJJJ. MarkWest is subject to the recordkeeping, monitoring, and testing required by 40CFR60 Subpart KKK, and 40CFR60 Subpart JJJJ.

45CSR30 (Requirements for Operating Permits)

MarkWest is a nonmajor source subject to 45CSR30. MarkWest is subject to 45CSR30 due to them being subject to 40CFR60 Subpart KKK.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984. The Majorsville Gas Plant is subject to this rule due to the natural gas processing facility. MarkWest must meet the LDAR requirements of Subpart KKK.

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

40CFR60 Subpart JJJJ sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007, for engines with a maximum rated power capacity greater than 500 hp. The four proposed engine will be subject to this rule. The emission limits for the Caterpillar G3616 engine (C-2102) are the following: NO_x – 2.0 g/hp-hr (20.86 lb/hr); CO – 4.0 g/hp-hr (41.72 lb/hr); and VOC – 1.0 g/hp-hr (10.43 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met. Because the engines will not be certified by the manufacturer, MarkWest will demonstrate compliance by conducting initial and subsequent performance testing. MarkWest will also be required to maintain a maintenance plan and associated records.

The following regulations may apply to the facility:

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

40CFR63 Subpart HHH (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)

This action promulgates national emission standards for hazardous air pollutants (NESHAP) for stationary reciprocating internal combustion engines (RICE) with a site rating of more than 500 brake horsepower (HP).

The facility is not a major source of HAPs, therefore it is not subject to 40CFR63 Subpart ZZZZ.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The facility will not be a major source of HAP's as defined by 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality impact analysis was performed.

MONITORING OF OPERATIONS

MarkWest will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all engines and combustion sources.

MarkWest will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in C-111, C-102, C-103, C-104, C-2102 H-741, H-781, H-2741 and FL-991.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by MarkWest for a period of five (5) years.

According to the DAQ Policy concerning tanks, since MarkWest's tanks are below 20,000 gallons, there will be no emission limits set on these tanks. In addition, there will be no maximum throughput set on these tanks in the permit. However, the tanks and their respective sizes will be listed in the Emission Units Table.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that MarkWest meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Marshall County location should be granted a 45CSR13 modification for their facility.

Jerry Williams II, P.E.
Engineer

Date